Adding value to UK grown timber in construction: a challenging opportunity in a future market

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ADDING VALUE TO UK GROWN TIMBER IN CONSTRUCTION. A CHALLENGING OPPORTUNITY IN A FUTURE MARKET

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SUMMARY

The usage of UK grown timber in construction has been taken into consideration other recent years. The major UK timber resources have been criticized as not economically vital for construction interest because of a number of considerations. The fast growing softwoods derived from UK woodlands have been undervalued, and often seen as lower quality compared to imported species because of the lower grading strength. However UK grown softwoods like Sitka spruce are often under graded, in an attempt to minimize the rejected timber and maximize the sawmills production efficiency. There is potential for use of spruce in higher value products like glued laminated Timber (glulam) and cross laminated timber (CLT), which might balance the economic inputs and benefits. This is especially the case if the producer's end products are not limited to glulam and CLT, as they can utilize the rejected timber into different co-products such as fuel. The manufacturer can therefore minimize the economic loss associated with rejects. Moreover, in future a forestry approach such as selection of appropriate species for future plantation planning could open a great market for local grown construction timber products. A better approach to evaluating and designing the products that will be needed for future applications could result in a better species planting mix that can be utilized into the desired materials.

KEYWORDS: CLT, glulam, UK grown timber, Construction market

INTRODUCTION

Timber in buildings has been considered as one of the most environmentally benign construction materials, mainly because it is renewable, it stores sequestered carbon dioxide during its service life and it requires less energy to process into wood products (Sathre and Gustavsson, 2009). The forecast trend on timber construction market shows significant increase as a result of trends towards environmental building (UNECE timber forecast, 2016). However this increasing market creates higher demands for timber, and therefore the increased usage of UK grown timber in construction has been taken into consideration the last years (Ramage et al. 2017).

The major UK timber resources have been criticized as not being economically vital for construction interests because of a number of considerations. The fast growing softwoods derived from UK woodlands have been undervalued, as lower quality (C16) comparing to imported species (C24+) because of the lower strength grading. However experimental data has shown that home grown timber have similar strength profiles to imported timber (Coombs, 2018). The main reason for this is the willingness to under grade home grown timber, e.g. using C16/fail grading systems, in an attempt to minimize the rejected timber and maximize the sawmill's production efficiency. In addition, the challenges of kiln drying locally grown timbers such as spruce to 12% moisture content (MC) have discouraged companies from producing structural timber for indoor uses (Crawford et al. 2013). As a

result of these practices, in the UK construction market 80% of the sawn timber is imported (Smith, 2013). This is a proof of the existence of an existing market that is currently dominated by imported timber, mainly from central and northern Europe. It is therefore important to understand the strengths and benefits that UK grown timber has to offer into construction market.

ENGENIREED WOOD MATERIALS

Glulam and cross laminated timber (CLT) have found great attention in the timber construction market over recent years (Zumbrunnen et al. 2012). The great benefit of these products is that they have been developed for utilisation of fast grown timber species, and the products have been proved ideal for construction. In particular CLT has been used successfully as a construction material, not only for house structures but also for high rise buildings with excellent performance, e.g. seismic and fire resistance. CLT has been introduced into the UK market as an imported material and its usage in different construction projects has increased steadily since its first appearance in the market in approximately 2003. The production of CLT in central Europe and Scandinavia is expanding year on year, however demand exceeds supply, increasing the cost for building using these materials in the UK, which may reduce use of this sustainable material (Crawford et al. 2013). Therefore the usage of local timber presents an opportunity to reduce the material costs and to increase the usage of CLT in UK. This highly environmentally friendly building material can contribute significantly into the reduction of greenhouse gasses associated with buildings at the construction stage. However to date these products have not been manufactured in UK using local grown timber because of the limitations mentioned above.

The challenge of drying local timber to 12% MC is a major factor, as sawmills in the UK do not produce sawn wood at this low moisture content. Traditionally such drying was seen as not being economically viable, because of the potential for a higher percentage of rejected dried graded timber. This is especially the case with Sitka spruce, which is the most abundant UK softwood timber resource. This species appears to present the greatest challenge for kiln drying to 12% MC (Crawford et al. 2013). However the potential for use of spruce in higher value products like CLT may balance the economic inputs, especially if the end product range of the producer is not limited to glulam and CLT, as they can utilize the rejected timber into different products like fuel, and therefore minimize the economic losses associated with the reject rate.

DISCUSSION

Even though local grown Sitka spruce has been proved of being a suitable species for CLT production it still being criticized as not being economically viable the challenge of achieving a high yield of graded dried timber. It is however important to consider the value addition potential of using it in a high performance product like CLT. The dispersion of defects within the laminated product has long been recognised as increasing mechanical properties of timber. CLT and glulam therefore present significant opportunities to homegrown timber such as spruce.

In addition, there is a need to consider a forestry approach to the future species mix in plantations. Such a future plan could open a great market for locally grown construction timber products. A better approach to evaluating and designing products that will contribute to future use of timber could result in plantations with a better species mix that can be used to

manufacture the desired materials. The understanding of the future needs, and prediction of desired timber products for construction, such as CLT and glulam, could lead to a detailed planning from the plantation to the sawmill and manufacture. Production of the correct range of products would ensure both the suitability of the species and the availability, which will lead to construction products manufactured from sustainably produced UK grown timber. It is essential that the future planning of forestry plantation to be in line with the needs of the future demands and in agreement with the material development and innovation.

CONCLUSIONS

An overall approach to designing new products such as CLT to utilise UK grown timber could provide an excellent and viable solution, supporting this both economic and sustainable market. The projection of the market needs for materials and the plantation design to cover these market demands can maximise the UK grown timber usage in construction in order to cover the building needs of the future.

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